L Number	Hits	Search Text	DB	Time stamp
1	1	6011909.pn.	USPAT; US-PGPUB	2004/03/08 10:48
-	1124	709/218.ccls.	USPAT; US-PGPUB	2004/03/08 09:26
-	13912	first near network	USPAT; US-PGPUB	2003/08/24 18:01
-	4849	(first near network) same ((second or another) near network)	USPAT; US-PGPUB	2003/08/24 18:02
-	812	((first near network) same ((second or another) near network)) same interface$1	USPAT; US-PGPUB	2003/08/24 18:03
-	230	(((first near network) same ((second or another) near network)) same interface$1) same (obtain$3 or get$4 or generat$4 or send$3)	USPAT; US-PGPUB	2003/08/24 18:03
-	170	((((first near network) same ((second or another) near network)) same interface$1) same (obtain$3 or get$4 or generat$4 or send$3)) same (information or data or identif$6)	USPAT; US-PGPUB	2003/08/24 18:06
-	80	(((((first near network) same ((second or another) near network)) same interface$1) same (obtain$3 or get$4 or generat$4 or send$3)) same (information or data or identif$6)) and (@ad<19990817 or @prad<19990817)	USPAT; US-PGPUB	2003/09/07 19:40
-	5	(((((first near network) same ((second or another) near network)) same interface$1) same (obtain$3 or get$4 or generat$4 or send$3)) same (information or data or identif$6)) same Internet	USPAT; US-PGPUB	2003/08/24 18:07
-	3	((((((first near network) same ((second or another) near network)) same interface$1) same (obtain$3 or get$4 or generat$4 or send$3)) same (information or data or identif$6)) same Internet) and (@ad<19990817 or @prad<19990817)	USPAT; US-PGPUB	2003/08/24 18:07
-	0	6560221.pn. and gateway	USPAT; US-PGPUB	2003/09/07 19:29
-	1	6560221.pn. and ((router or proxy or server) same interface)	USPAT; US-PGPUB	2003/09/07 19:39
-	0	6560221.pn. and (web adj server$1)	USPAT; US-PGPUB	2003/09/07 19:39
-	1	6560221.pn. and (server$1)	USPAT; US-PGPUB	2003/09/07 20:55
-	80	(((((first near network) same ((second or another) near network)) same interface$1) same (obtain$3 or get$4 or generat$4 or send$3)) same (information or data or identif$6)) and (@ad<19990817 or @prad<19990817)	USPAT; US-PGPUB	2003/09/07 20:55
-	5	((((((first near network) same ((second or another) near network)) same interface$1) same (obtain$3 or get$4 or generat$4 or send$3)) same (information or data or identif$6)) and (@ad<19990817 or @prad<19990817)) and (second same (web adj server$1))	USPAT; US-PGPUB	2003/09/07 19:42
-	1	6560221.pn.	USPAT; US-PGPUB	2003/09/07 20:55
-	93281	(first and second) same network$1	USPAT; US-PGPUB	2004/03/08 09:27
-	12723	(first and second) same network$1 same interface$1	USPAT; US-PGPUB	2004/03/08 09:28
-	1154	((first and second) same network$1 same interface$1).ab.	USPAT; US-PGPUB	2004/03/08 09:29
-	114	((first and second) same network$1 same (user adj interface$1)).ab.	USPAT; US-PGPUB	2004/03/08 09:30

-	114	((first and second) same network$1 same (user adj interface$1)).ab. and (user or client)	USPAT; US-PGPUB	2004/03/08 09:31
-	46	((first and second) same network$1 same (user adj interface$1)same communicat$5).ab. and (user or client)	USPAT; US-PGPUB	2004/03/08 09:38
-	8	((first and second) adj network$1 same (user adj interface$1)same communicat$5).ab. and (user or client)	USPAT; US-PGPUB	2004/03/08 10:47

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United States Patent [19]

Newlin et al.

[11] Patent Number: 6,011,909

[45] Date of Patent: Jan. 4, 2000

[54] **ALERTING USER ENGAGED IN A FIRST COMMUNICATIONS SESSION ON A FIRST NETWORK TO A REQUEST TO ESTABLISH A SECOND COMMUNICATIONS SESSION ON A SECOND NETWORK**

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[73] Assignee: **Motorola, Inc.**, Schaumburg, Ill.

[21] Appl. No.: **08/779,083**

[22] Filed: **Jan. 6, 1997**

[51] **Int. Cl.**[7] **H04L 12/00**

[52] **U.S. Cl.** **395/200.57**; 379/93.35; 379/215

[58] **Field of Search** 395/200.34, 200.57; 370/260, 264, 265, 353; 379/93.23, 93.35, 202, 204, 215, 93.21

[56] **References Cited**

U.S. PATENT DOCUMENTS

3,883,697	5/1975	Brown	179/18 BC
4,782,442	11/1988	Kojima et al.	364/200
4,847,829	7/1989	Tompkins et al.	370/62
4,899,358	2/1990	Blakeley	379/67
4,922,523	5/1990	Hashimoto	379/96
4,953,159	8/1990	Hayden et al.	370/62
4,995,071	2/1991	Weber et al.	379/53
5,007,076	4/1991	Blakley	379/67
5,034,948	7/1991	Mizutani et al.	370/79
5,042,062	8/1991	Lee et al.	379/54
5,121,424	6/1992	Mano	379/165
5,195,086	3/1993	Baumgartner et al.	370/62
5,247,615	9/1993	Mori et al.	395/200
5,263,084	11/1993	Chaput et al.	379/142
5,278,889	1/1994	Papanicolaou et al.	379/53
5,329,308	7/1994	Binns et al.	348/14
5,343,240	8/1994	Yu	348/14
5,371,534	12/1994	Dagdeviren	348/14
5,418,625	5/1995	Shimoosawa	358/442
5,519,767	5/1996	O'Horo et al.	379/97
5,533,102	7/1996	Robinson et al.	379/67
5,534,914	7/1996	Flohr et al.	348/15
5,557,320	9/1996	Krebs	348/12
5,572,442	11/1996	Schulhof et al.	364/514 C
5,583,924	12/1996	Lewis	379/412
5,615,339	3/1997	Ban	395/200.12
5,619,561	4/1997	Reese	379/142
5,621,662	4/1997	Humphries et al.	364/550
5,627,825	5/1997	Barraclough et al.	370/260
5,636,269	6/1997	Eisdorfer	379/215

(List continued on next page.)

OTHER PUBLICATIONS

CRTC Approves SmartPac with Visual Call Waiting: Bulletin, www.bell.ca/bell/eng/library/nr/96/sb96e109.htm, May 1996.

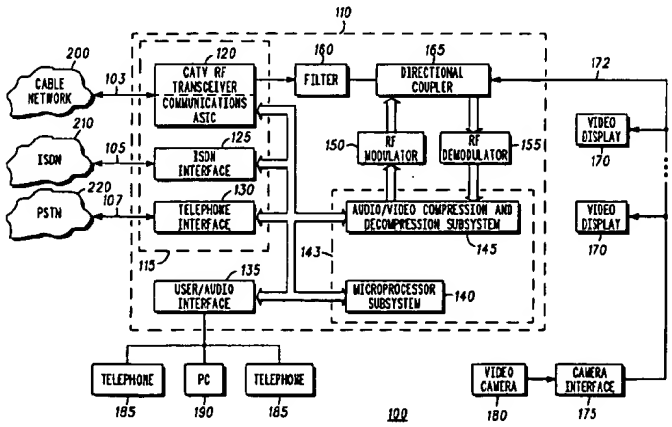
BellSouth Solutions Group, Call Waiting, www.flbsg.com/catalog/alphalist/alpha07k.html, 1996.

Primary Examiner—Lance Leonard Barry, Esq.
Attorney, Agent, or Firm—Terri S. Hughes

[57] **ABSTRACT**

An apparatus and method are provided for multimedia communications with multiple network functionality, such as conflict resolution for multiple simultaneous communication sessions involving separate and independent networks and call types, such as video and voice. The apparatus includes a first network interface, such as a cable interface (**120**), an ISDN interface (**125**) or a telephony interface (**130**), with the first network interface coupleable to a first network for communication of a first network signal; a second network interface, the second network interface coupleable to a second network for communication of a second network signal; a user interface such as a user/audio interface (**135**) for reception of a plurality of control signals; and a processor arrangement (**143**) responsive through a set of program instructions, when operably coupled, to determine a presence of a first network communication session, to further determine an occurrence of the second network signal, and upon the occurrence of the second network signal during the first network communication session, to provide a distinctive alert to the user interface during the first network communication session indicating the occurrence of the second network signal.

21 Claims, 2 Drawing Sheets



U.S. PATENT DOCUMENTS

5,640,196	6/1997	Behrens et al.	348/14
5,675,375	10/1997	Riffee	348/15
5,699,413	12/1997	Sridhar	379/98
5,734,589	3/1998	Kostreski et al.	364/514 A
5,754,484	5/1998	Perreault	365/200
5,761,293	6/1998	Newlin et al.	379/230
5,764,748	6/1998	Rosenthal et al.	379/215
5,774,357	6/1998	Hoffberg et al.	364/188
5,784,448	6/1998	Yaker	379/215

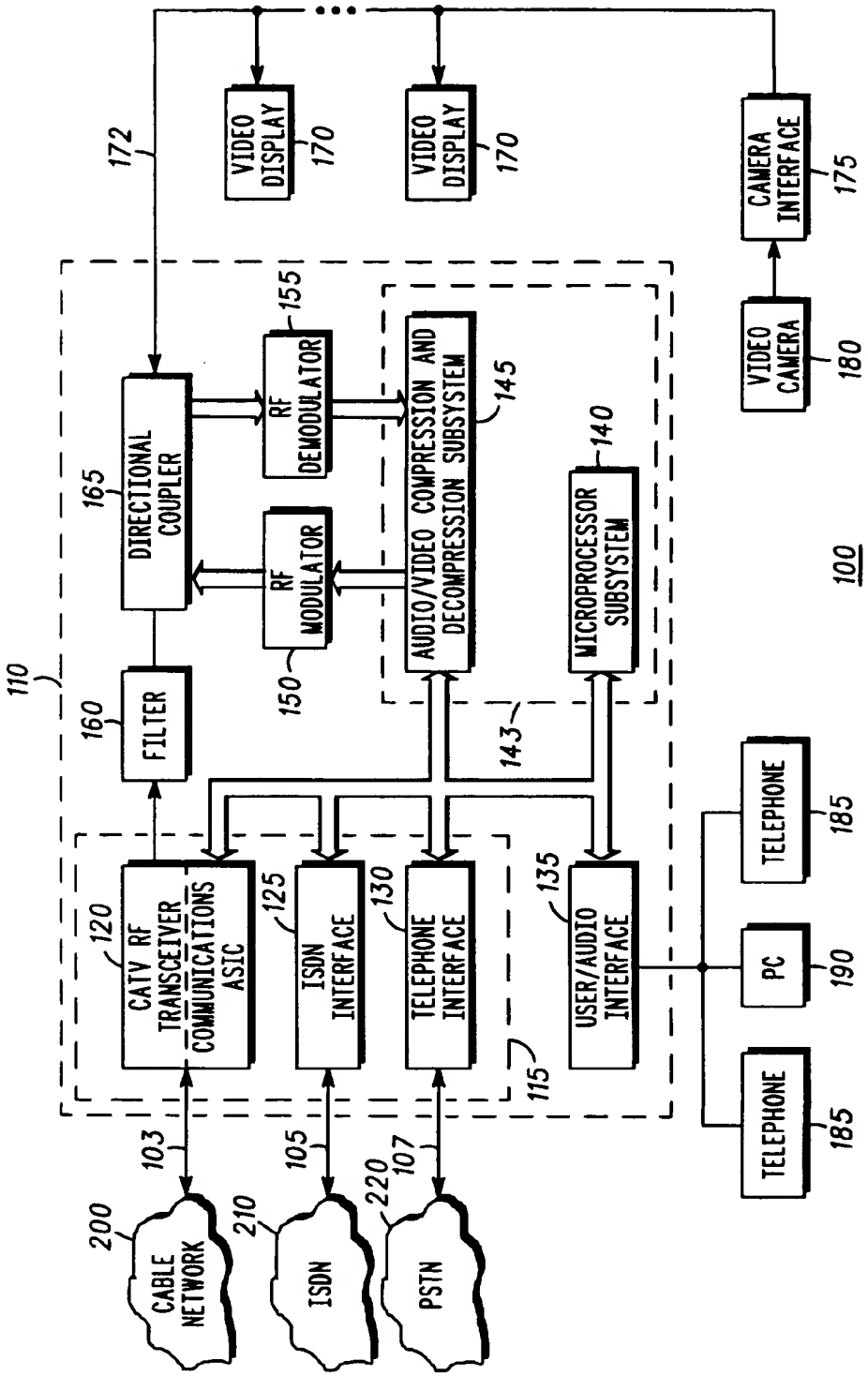

VIDEO DISPLAY
170
VIDEO DISPLAY
170
CAMERA INTERFACE
175
172
VIDEO CAMERA
180
155
RF DEMODULATOR
AUDIO/VIDEO COMPRESSION AND DECOMPRESSION SUBSYSTEM
145
140
MICROPROCESSOR SUBSYSTEM
165
DIRECTIONAL COUPLER
RF MODULATOR
150
110
160
FILTER
143
100
CATV RF TRANSCEIVER COMMUNICATIONS ASIC
120
ISDN INTERFACE
125
TELEPHONE INTERFACE
130
USER/AUDIO INTERFACE
135
TELEPHONE
185
PC
190
TELEPHONE
185
115
103
105
107
220
200
CABLE NETWORK
210
ISDN
PSTN

FIG. 1

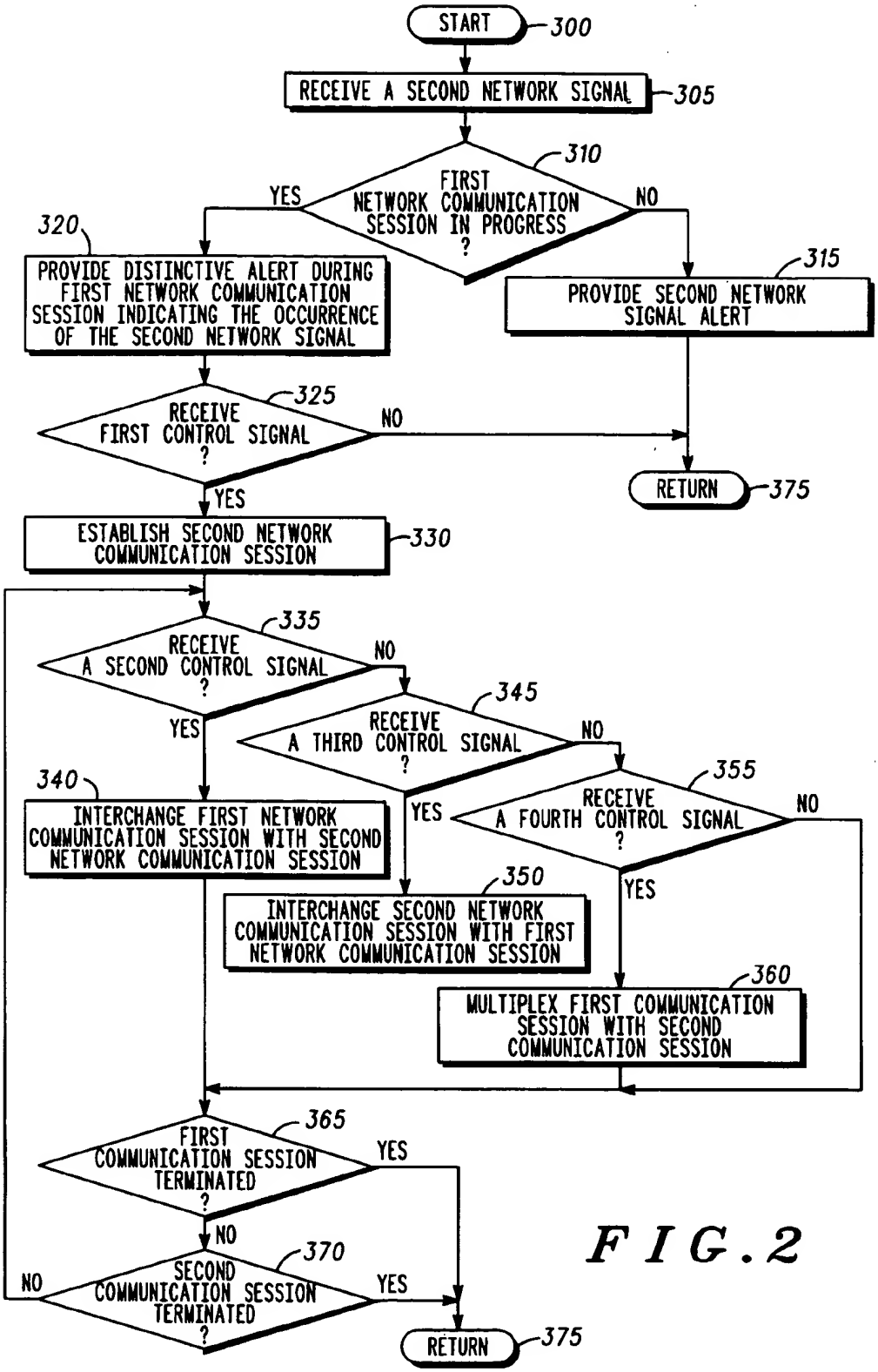

START
300
RECEIVE A SECOND NETWORK SIGNAL
305
FIRST NETWORK COMMUNICATION SESSION IN PROGRESS ?
310
YES
NO
320
PROVIDE DISTINCTIVE ALERT DURING FIRST NETWORK COMMUNICATION SESSION INDICATING THE OCCURRENCE OF THE SECOND NETWORK SIGNAL
315
PROVIDE SECOND NETWORK SIGNAL ALERT
RECEIVE FIRST CONTROL SIGNAL ?
325
NO
YES
RETURN
375
ESTABLISH SECOND NETWORK COMMUNICATION SESSION
330
RECEIVE A SECOND CONTROL SIGNAL ?
335
NO
YES
RECEIVE A THIRD CONTROL SIGNAL ?
345
NO
YES
340
INTERCHANGE FIRST NETWORK COMMUNICATION SESSION WITH SECOND NETWORK COMMUNICATION SESSION
RECEIVE A FOURTH CONTROL SIGNAL ?
355
NO
YES
350
INTERCHANGE SECOND NETWORK COMMUNICATION SESSION WITH FIRST NETWORK COMMUNICATION SESSION
360
MULTIPLEX FIRST COMMUNICATION SESSION WITH SECOND COMMUNICATION SESSION
FIRST COMMUNICATION SESSION TERMINATED ?
365
YES
NO
SECOND COMMUNICATION SESSION TERMINATED ?
370
NO
YES
RETURN
375

FIG. 2

ALERTING USER ENGAGED IN A FIRST COMMUNICATIONS SESSION ON A FIRST NETWORK TO A REQUEST TO ESTABLISH A SECOND COMMUNICATIONS SESSION ON A SECOND NETWORK

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is related to the following United States Patent Applications, each incorporated by reference herein, with priority claimed for all commonly disclosed subject matter:

Newlin et al., U.S. patent application Ser. No. 08/658,792, filed Jun. 5, 1996, entitled "Audio/Visual Communication System and Method Thereof", (the "first related application");

Burke et al., U.S. patent application Ser. No. 08/706,100, filed Aug. 30, 1996, entitled "Apparatus, Method And System For Audio And Video Conferencing And Telephony", (the "second related application");

Burke et al., U.S. patent application Ser. No. 08/715,887, filed Sep. 18, 1996, entitled "Videophone Apparatus, Method And System For Audio And Video Conferencing And Telephony", (the "third related application");

Newlin et al., U.S. Pat. No. 5,761,293, filed Jun. 28, 1996, entitled "ISDN Communication System and Method Thereof", (the "fourth related application");

Burke et al., U.S. patent application Ser. No. 08/725,602, filed Oct. 3, 1996, entitled "Apparatus, Method And System For Wireline Audio And Video Conferencing And Telephony", (the "fifth related application"); and

Burke et al., U.S. patent application Ser. No. 08/726,329, filed Oct. 3, 1996, entitled "Videophone Apparatus, Method And System For Wireline Audio And Video Conferencing And Telephony", (the "sixth related application");

Newlin et al., U.S. patent application Ser. No. 08/735,295, filed Oct. 22, 1996, entitled "Apparatus, Method And System For Multimedia Control And Communication", (the "seventh related application");

Burke et al., U.S. patent application Ser. No. 08/757,184 filed Nov. 27, 1996, entitled "Apparatus, Method And System For Wireless Audio And Video Conferencing And Telephony", (the "eighth related application"); and

Newlin, U.S. patent application Ser. No. 08/763,159,filed Dec. 10, 1996, entitled "Apparatus, Method And System For Wireline Audio And Video Conferencing And Telephony, With Network Interactivity", (the "ninth related application").

FIELD OF THE INVENTION

This invention relates in general to audio, video and multimedia communications systems and, more specifically, to an apparatus and method for multimedia communications with multiple network functionality.

BACKGROUND OF THE INVENTION

The various related applications disclose apparatuses, methods and systems for multimedia communications, such as video conferencing and telephony, over a variety of communications channels, such as wireline, cable, and hybrid fiber coaxial cable, and utilizing a variety of communications networks, such as an Integrated Services Digital Network ("ISDN"), the Public Switched Telephone Network ("PSTN"), and cable networks.

One particularly interesting feature of the various apparatuses (and systems) disclosed in the related applications is their capability for simultaneous connection to multiple networks, such as simultaneous connection to ISDN, PSTN, and cable networks. Such simultaneous connectivity, however, creates a simultaneous need for conflict resolution capability or prioritization between potential conflicting uses involving different and independent networks. For example, conflict resolution capability may be needed when the user is engaged in a video conference over an ISDN line while an incoming PSTN call is being received. Prior art capabilities have been strictly limited to conflict resolution within a single line from a single network, for example, providing call waiting or a busy signal for additional PSTN calls while a PSTN call is in progress on the one line. Such prior art call waiting or busy signaling has also been under network control, rather than local control of the user. The prior art has not provided for such conflict resolution capability when multiple separate and independent networks may be involved. In addition, the prior art has not provided for such conflict resolution under the local control of the user, rather than network control.

Accordingly, a need has remained for providing an apparatus and method for multimedia communications with multiple network functionality and services, such as conflict resolution capability or prioritization between potential conflicting uses involving different and independent networks. Such multimedia communications with multiple network functionality preferably should be under local control, rather than network control. In addition, such multimedia communications with multiple network functionality preferably should include other intelligent network functionality or services such as multimedia caller identification, should be user friendly, easy to install and use, and should be relatively less expensive for in-home purchase and use by consumers and other subscribers.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a block diagram illustrating an apparatus for multimedia communications with multiple network functionality in accordance with the present invention.

FIG. **2** is a flow diagram illustrating a method for multimedia communications with multiple network functionality in accordance with the present invention.

DETAILED DESCRIPTION OF THE INVENTION

As mentioned above, a need has remained for providing an apparatus and method for multimedia communications with multiple network functionality, such as providing conflict resolution capability or prioritization between potential conflicting or contending uses involving separate and independent networks. For video conferencing, "video call waiting" is provided by the apparatus and method of the present invention. In addition, a need has remained for such multimedia communications with multiple network functionality to also include other intelligent network functionality or services such as multimedia caller identification. As discussed in detail below, the apparatus and method in accordance with the present invention provide such multimedia communications with multiple network functionality, are user friendly, easy to install and use, and should be relatively less expensive for in-home purchase and use by consumers and other subscribers.

FIG. **1** is a block diagram illustrating an apparatus **110** for multimedia communications with multiple network func-

tionality in accordance with the present invention. The various components comprising apparatus **110** have been disclosed and discussed in detail in the related applications, and in the interests of brevity, will not be elaborated upon herein. As illustrated in FIG. **1**, the apparatus **110** is coupled or connected to three separate and independent networks, a first network such as cable network **200** (via first communication channel **103**), a second network such as ISDN **210** (via second communication channel **105**), and a third network such as PSTN **220** (via third communication channel **107**). While illustrated with connection to three separate and independent networks, the apparatus **110** will typically be directly connected to only two networks, such as cable network **200** and PSTN **220** (although multiple networks also may be accessible through the cable network **200**). The apparatus **110** is connected to these networks **200**, **210** and **220** through the network interfaces **115**, namely, cable network (CATV) radio frequency (RF) transceiver (with communications ASIC) **120**, ISDN interface **125**, and telephony (PSTN or POTS (plain old telephone service)) interface **130**. The network interfaces **115** are connected to a processor arrangement **143**, which in turn is comprised of a microprocessor subsystem **140** and an audio/video compression and decompression subsystem **145**.

Continuing to refer to FIG. **1**, the processor arrangement **143** is connected to an RF modulator **150** and an RF demodulator **155** which are utilized, respectively, to transmit and receive video signals on line (or channel) **172** (via directional coupler **165**), such as for video conferencing. Video signals are typically transmitted as compressed signals, and corresponding compression and decompression occurs in the audio/video compression and decompression subsystem **145** utilizing protocols such as, for example, H.320 for ISDN or H.324 for PSTN video calls. Transmitted video signals (from a far end or remote party) are displayed on any of the video displays **170**, while video signals to be received (and sent to the far end or remote party) are generated by the video camera **180** and camera interface **175**. Video signals from a cable network, such as cable television signals, pass through filter **160** and directional coupler **165**, and also may be viewed on the various video displays **170**. The processor arrangement **143** is also connected to a user interface such as user/audio interface **135**, which provides for audio input and output (via telephones **185**), and also provides for the reception or entry of a plurality of control signals, discussed in greater detail below, which may include control signals input from a telephone **185**, such as off hook, on hook, flash, various DTMF tones, or other programmed or programmable control signals, such as control signals input from a personal computer (PC) **190**.

As discussed in the related applications, the processor arrangement **143** may be comprised of a single integrated circuit ("IC"), or may include a plurality of integrated circuits or other components connected or grouped together, such as microprocessors, digital signal processors, ASICs, associated memory (such as RAM and ROM), and other ICs and components. As a consequence, as used herein, the term processor arrangement should be understood to equivalently mean and include a single processor, or arrangement of processors, microprocessors, controllers, or some other grouping of integrated circuits which perform the functions discussed in greater detail below, with associated memory, such as microprocessor memory or additional RAM, ROM, EPROM or E^2PROM. As discussed in greater detail below, the methodology of the invention may be programmed and stored, as a set of program instructions for subsequent execution, in the processor arrangement **143** with its associated memory and other equivalent components. In the preferred embodiment, as discussed in greater detail below, the processor arrangement **143** is responsive through a et of program instructions, when operably coupled (i.e., turned on and powered up), to determine a presence of a first network communication session, to further determine an occurrence of a second network signal, and upon the occurrence of the second network signal during the first network communication session, to provide a distinctive alert to the user interface (such as user/audio interface **135**) during the first network communication session indicating the occurrence of the second network signal. The distinctive alert, for example, may be a special audio tone transmitted to a telephone **185**, or may be a video caller identification displayed on one of the video displays **170**. As discussed in greater detail below, the processor arrangement **143**, in response to a first control signal of the plurality of control signals, is further responsive to establish a second network communication session during the first network communication session, enabling a user to have and maintain two separate and independent communication sessions, such as an ISDN video call and a POTS telephone call. In response to other control signals, the processor arrangement **143** is responsive to interchange or toggle between the various communication sessions, or combine or multiplex the communication sessions, such as displaying two video calls simultaneously in a split-screen or window format.

The distinctive alert generated by the processor arrangement **143** may have a variety of forms. For example, the distinctive alert for a PSTN **220** call may include caller identification information, which may be displayed on a separate device or displayed on one of the video displays **170**. Such PSTN caller identification information is typically transmitted as inband FSK modulated data, which may then be demodulated (by the telephony interface **130**) and decoded by the processor arrangement **143** for subsequent display. ISDN caller identification is typically included in Q.931 signaling information, which also may be parsed and presented to the user. In addition, certain callers (far end or remote parties) may also be identified or registered as video conferencing capable, which may also be utilized to indicate that an incoming call is a video call. This allows an intelligent method for either accepting or rejecting an incoming video or other call. In addition, each of the various combinations and permutations may be classified and utilized to generate a plurality of distinctive alerts, with each distinctive alert corresponding to a type of incoming second network signal, such as a first distinctive alert for an incoming ISDN video call, a second distinctive alert for an incoming PSTN video call, etc. Also as indicated above, the distinctive alerts may have a variety of forms, such as an audio tone, a caller identification, or a video display (e.g., a window format display of caller identification or of a video image of the caller), a voice message, announcement or another form of voice identification (e.g., a stored voice prompt or a voice announcement from the calling party).

As indicated above, this functionality is under the local control of the user, through the entry of the various control signals, not under network control. This is accomplished through the user/audio interface **135**, which captures and interprets any control signals entered by the user, through the voice digital signal processor (DSP) discussed in the related applications. For example, if a control signal is a flash signal, such as the flash signal that currently in use for call waiting, rather than transmit the flash signal to a network as is currently done, the user/audio interface **135** captures and interprets the flash control signal locally only, to provide for

functionality across the various separate and independent networks (rather than strictly within a one, given network). For example, a user engaged in a video conference call via, for example, the ISDN network **210** or the cable network **200**, may simultaneously receive a POTS call via PSTN **220**. Utilizing a local control signal, the user may maintain the video call in progress and answer the POTS call, followed by returning to the video call, terminating the video call, or multiplexing the POTS call with the voice portion of the video call.

FIG. **2** is a flow diagram illustrating a method for multimedia communications with multiple network functionality in accordance with the present invention. As mentioned above, the method is programmed (and stored as a set of program instructions) in the processor arrangement **143** and any associated memory. Beginning with start step **300**, a second network signal is received, step **305**. The method then determines whether a first network communication session is in progress, step **310**. If no first network communication session is in progress in step **310**, then in step **315** a second network signal alert is provided, such as an incoming ring signal, and following step **315**, no further steps need to be performed and the method may end, return step **375**. When a first network communication session is in progress in step **310**, then in step **320**, the method (via processor arrangement **143**) provides a distinctive alert during the first network communication session, indicating (and thereby notifying the user) of the second network signal. For example, a user engaged in a POTS voice call, as a first communication session, may hear a double beep tone as a distinctive alert notifying the user of an incoming ISDN video call. Following step **320**, in step **325**, the method determines whether a first control signal (of a plurality of control signals) has been received, and when a first control signal has been received (indicating that the user desires to establish a second network communication session), a second network communication session is established, step **330**. Following the example above, a flash signal may be received, indicating that the user would like to establish the ISDN video call (during the POTS call, or terminating the POTS call (step **365**, below)). If a first control signal is not received, the method may end, step **375**, indicating that the user did not want to answer or accept the incoming second network signal.

Continuing to refer to FIG. **2**, following the establishment of the second network communication session (concurrently or simultaneously with the first network communication session) in step **330**, depending upon the control signal entered by the user, the user may choose to participate in either or both the first network and second network communication sessions. For example, utilizing a call waiting approach, the user may participate (communicate) in the second network communication session while the first network communication session is maintained on hold. For various networks, such as ISDN network **210**, such holding may be accomplished by transmitting idle or other dummy bits. As a consequence, following step **330**, when a second control signal (such as a flash) is received, step **335**, the first network communication session is interchanged with the second network communication session, step **340**, such as by putting the first network communication session on hold while participating in the second network communication session. Similarly, when a third control signal (such as a second flash signal) is received, step **345**, the second network communication session is interchanged with the first network communication session, step **350**, such as returning to the first network communication session from the second network communication session. When a fourth control signal (such as a double flash signal or a DTMF tone) is received, step **355**, the first network and second network communication sessions are multiplexed, step **360**, such as forming a conference call involving multiple parties or concurrently displaying two video conferencing images. When either the first network communication session is terminated in step **365** or the second network communication session is terminated in step **370**, the method may end, return step **375**. While both sessions continue, the method returns to step **335**, for reception of any control signals which may be entered by the user.

Detection of a second incoming call, such as detection of the second network signal in step **305** above, is accomplished by the corresponding network interface (of the network interfaces **115**), which signals the microprocessor subsystem **140** of various events. For example, a data access arrangement (DAA) on the telephony interface **130**, as disclosed in the related applications, includes a ring detector which will signal the microprocessor subsystem **140** when ringing voltage is applied to the line as in an incoming call. However, ringing by itself does not determine the type of incoming call, audio-only or audio/video. As part of provisioning the apparatus **110**, a unique directory number may be assigned for the POTS service and another number for the video call service with distinctive alerting, so that the subscriber (or other user) may audibly distinguish the type of call. However, for the apparatus **110** to automatically determine the type of call, it may also associate the ringing pattern with the type of call. This may be accomplished through a learning process where the microprocessor subsystem **140** "records" the ringing pattern associated with each type of call when received individually, and uses that information for call waiting purposes. This method of detection is highly desirable since the network interface is not "answered" or taken off hook unless the user makes this decision. Another method of determining the call type is for the telephony interface **130** to go "off hook" and analyze the received audio signal. A tone detection algorithm may be run to search for the presence of the characteristic carrier of a V.34 modem signal. If detected, the call is assumed to be a video call and presented to the user as such. With the ISDN interface **125**, Q.931 messaging is used for incoming call determination and call acceptance. The same is true for the cable interface **120** (CATV RF transceiver with communications ASIC), in which specific CACS protocol messaging is used to inform the apparatus **110** of an incoming call, as disclosed in the related applications.

While the apparatus **110** is illustrated in FIG. **1** for three network types, such as cable, ISDN and PSTN, additional multimedia networks may also be supported. For example, the apparatus **110** may also be connected, through corresponding network interfaces, with a wireless network, with an Ethernet, or other packet-based networks, such as for Internet based video.

As may be apparent from the above discussion, the apparatus and method of the present invention provides numerous advantages. Most significantly, the present invention provides for conflict resolution between simultaneous communication sessions across different network types, and significantly separate and independent networks, and across different types of calls, such as voice and video calls. In addition, such conflict resolution is seamless across such network types and call types. Moreover, such multiple network functionality is under the local control of the user.

From the foregoing, it will be observed that numerous variations and modifications may be effected without depart-

ing from the spirit and scope of the novel concept of the invention. It is to be understood that no limitation with respect to the specific methods and apparatus illustrated herein is intended or should be inferred. It is, of course, intended to cover by the appended claims all such modifications as fall within the scope of the claims.

What is claimed is:

1. An apparatus for multimedia communications with multiple network functionality, the apparatus comprising:

a first network interface, the first network interface coupleable to a first network for communication of a first network signal, wherein the first network is selected from a set of networks consisting of a cable network, an integrated services digital network or a public switched telephone network;

a second network interface, the second network interface coupleable to a second network for communication of a second network signal, wherein the second network is also selected from the set of networks, but a different selection from the first network;

a user interface for reception of a plurality of control signals; and

a processor arrangement coupled to the first network interface, to the second network interface and to the user interface, the processor arrangement responsive through a set of program instructions, when operably coupled,

to determine a presence of a first network communication session,

to further determine an occurrence of a second network signal requesting establishment of a session on the second network,

and upon the occurrence of the second network signal during the first network communication session, to provide a distinctive alert to the user interface during the first network communication session indicating the occurrence of the second network signal.

2. The apparatus of claim 1 wherein the processor arrangement, in response to a first control signal of the plurality of control signals, is further responsive to establish a second network communication session during the first network communication session.

3. The apparatus of claim 2 wherein the processor arrangement, in response to a second control signal of the plurality of control signals, is further responsive to interchange the first network communication session with the second network communication session.

4. The apparatus of claim 2 wherein the processor arrangement, in response to a third control signal of the plurality of control signals, is further responsive to interchange the second network communication session with the first network communication session.

5. The apparatus of claim 2 wherein the processor arrangement, in response to a fourth control signal of the plurality of control signals, is further responsive to multiplex the first network communication session with the second network communication session.

6. The apparatus of claim 1 wherein the first network and the second network are separate and independent.

7. The apparatus of claim 1 wherein the distinctive alert is an audio tone.

8. The apparatus of claim 1 wherein the distinctive alert is a caller identification.

9. The apparatus of claim 1 wherein the distinctive alert is a video caller identification.

10. The apparatus of claim 1 wherein the distinctive alert is a voice message.

11. A method for multimedia communications with multiple network functionality, the method comprising:

(a) determining a presence of a communication session on a first network, wherein the first network is selected from a set of networks consisting of a cable network, an integrated services digital network or a public switched telephone network;

(b) determining a presence of a signal on a second network requesting establishment of a session on the second network, wherein the second network is also selected from the set of networks but a different selection from the first network; and

(c) providing a distinctive alert during the first network communication session indicating the presence of the second network signal.

12. The method of claim 11, further comprising:

(d) in response to a first control signal of a plurality of control signals, establishing a second network communication session during the first network communication session.

13. The method of claim 12, further comprising:

(e1) in response to a second control signal of the plurality of control signals, interchanging the first network communication session with the second network communication session.

14. The method of claim 12, further comprising:

(e2) in response to a third control signal of the plurality of control signals, interchanging the second network communication session with the first network communication session.

15. The method of claim 12, further comprising:

(e3) in response to a fourth control signal of the plurality of control signals, multiplexing the first network communication session with the second network communication session.

16. The method of claim 11 wherein the first network and the second network are separate and independent.

17. The method of claim 11 wherein the distinctive alert is an audio tone.

18. The method of claim 11 wherein the distinctive alert is a caller identification.

19. The method of claim 11 wherein the distinctive alert is a video caller identification.

20. The method of claim 11 wherein the distinctive alert is a voice message.

21. An apparatus for multimedia communications with multiple network functionality, the apparatus comprising:

a first network interface, the first network interface coupleable to a first network for communication of a first network signal;

a second network interface, the second network interface coupleable to a second network for communication of a second network signal, the second network being separate and independent from the first network;

a user interface for reception of a plurality of control signals; and

a processor arrangement coupled to the first network interface, to the second network interface and to the user interface, the processor arrangement responsive through a set of program instructions, when operably coupled, to determine a presence of a communication session on the first network, wherein the first network is selected from a set of networks consisting of a cable network, an integrated services digital network or a public switched telephone network, to further deter-

mine a presence of a signal on the second network requesting establishment of a session on the second network, the second network also selected from the set of networks but a different selection from the first network, and upon the occurrence of the second network signal during the first network communication session, to provide a distinctive alert to the user interface during the first network communication session indicating the occurrence of the second network signal;

in response to a first control signal of the plurality of control signals, the processor arrangement further responsive to establish a second network communication session during the first network communication session;

in response to a second control signal of the plurality of control signals, the processor arrangement further responsive to interchange the first network communication session with the second network communication session;

in response to a third control signal of the plurality of control signals, the processor arrangement further responsive to interchange the second network communication session with the first network communication session; and

in response to a fourth control signal of the plurality of control signals, the processor arrangement further responsive to multiplex the first network communication session with the second network communication session.

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